WHAT IS CLAIMED IS:

1. A spectroscopic apparatus, comprising:

a) a source of electromagnetic radiation (EMR);

b) a first aperture located between the source of EMR and a sample slot to produce a light path therebetween;

c) the sample slot in the apparatus for receiving a sample vessel to be placed within the light path;

d) a second aperture located in the light path, between the sample slot and one or more than one photodetector, the one or more than one photodetector in operative association with the spectroscopic apparatus; and

e) one or more than one primary calibration algorithm in operative association with the spectroscopic apparatus, the one or more than one primary calibration algorithm developed using one or more than one other apparatus, or one or more than one upgraded primary calibration algorithm in operative association with the spectroscopic apparatus.

2. The apparatus of claim 1, wherein the sample vessel is selected from the group consisting of, a cuvette, a sample tab, a pipette tip, tubing, a labeled test tube, an unlabeled test tube, blood bag tubing, a transparent sample container, a translucent sample container, and a flow-through cuvette.

3. The apparatus according to claim 2, wherein the sample tab contains the sample placed between a cover plate and a base plate, wherein at least a portion of the cover plate is transparent or translucent and at least a portion of the base plate is transparent or translucent, and wherein the cover plate is hingedly attached to the base plate.

4. The apparatus according to claim 1, wherein the source of EMR is selected from the group consisting of a tungsten lamp, one or more than one Light Emitting Diode (LED), and one or more than one laser.

5. The apparatus according to claim 1, wherein the one or more than one photodetector is selected from the group consisting of Photodiode or Charged Coupled Detector (CCD).

6. The apparatus according to claim 1, wherein the one or more than one photodetector is comprised of an array of detectors, housed inside a spectrometer within the spectroscopic apparatus, the spectrometer further comprising a diffraction grating.

7. The apparatus according to claim 1, wherein the one or more than one calibration algorithm was developed using an order derivative of absorbance of calibration samples, at one or more than one wavelength of a standard set of wavelengths, and a statistical technique selected from the group consisting of simple linear regression, multiple linear regression, and multivariate analysis.

8. The apparatus according to claim 7, wherein the multivariate analysis is selected from the group consisting of partial least squares, principal component analysis, neural network, and genetic algorithm.

9. The apparatus according to claim 1, wherein the sample is selected from the group consisting of whole blood, serum, plasma, urine, synovial fluid, lymphatic fluid, sputum, feces, cerebrospinal fluid and a non-biological sample.

10. The apparatus according to claim 1, wherein the one or more than one primary calibration algorithm is for an analyte selected from the group consisting of a Hb-based blood substitute, Total-Hb, Oxy-Hb, "Total-Hb minus Met-Hb," Met-Hb, bilirubin, biliverdin, methylene blue, and a combination thereof.

11. A spectroscopic apparatus comprising:

a) a source of electromagnetic radiation (EMR) for producing a light path;

b) an aperture located in the light path between the source of EMR and a sample slot;

c) a sample slot for receiving a sample vessel and placed within the light path, the sample slot comprising a first, and a second, side, the first side facing the source of EMR;

d) a reflective member positioned at or near the second side, the reflective member for reflecting the EMR that passes through the sample slot to produce a reflected light path;

e) one or more than one photodetector located within the reflected light path, the one or more than one photodetector in operative association with the spectroscopic apparatus;

f) one or more than one primary calibration algorithm in operative association with the spectroscopic apparatus, the one or more than one primary calibration algorithm developed using one or more than one other apparatus, or one or more than one upgraded primary calibration algorithm in operative association with the spectroscopic apparatus.

12. The apparatus of claim 11, wherein the sample vessel is selected from the group consisting of, a cuvette, a sample tab, a pipette tip, tubing, a labelled test tube, an unlabeled test tube, blood bag tubing, a transparent sample container, a translucent sample container, and a flow-through cuvette.

13. The apparatus according to claim 12, wherein the sample tab contains the sample placed between a cover plate and a base plate, wherein at least a portion of the cover plate is reflective, transparent or translucent and at least a portion of the base plate is reflective, transparent or translucent, and wherein the cover plate is hingedly attached to the base plate.

14. The apparatus according to claim 11, wherein the source of EMR is selected from the group consisting of a tungsten lamp, one or more than one Light Emitting Diode (LED), and one or more than one laser.

15. The apparatus according to claim 11, wherein the one or more than one photodetector is selected from the group consisting of Photodiode or Charged Coupled Detector (CCD).

16. The apparatus according to claim 11, wherein the one or more than one photodetector is comprised of an array of detectors, housed inside a spectrometer within the spectroscopic apparatus, the spectrometer further comprising a diffraction grating.

17. The apparatus according to claim 11, wherein the one or more than one calibration algorithm was developed using an order derivative of absorbance of calibration samples, at one or more than one wavelength of a standard set of wavelengths, and a statistical technique selected from the group consisting of simple linear regression, multiple linear regression, and multivariate analysis.

18. The apparatus according to claim 17, wherein the multivariate analysis is selected from the group consisting of partial least squares, principal component analysis, neural network, and genetic algorithm.

19. The apparatus according to claim 11, wherein the sample is selected from the group consisting of whole blood, serum, plasma, urine, synovial fluid, lymphatic fluid, sputum, feces, cerebrospinal fluid and a non-biological sample.

20. The apparatus according to claim 11, wherein the one or more than one primary calibration algorithm is for an analyte selected from the group consisting of a Hb-based blood substitute, Total-Hb, Oxy-Hb, "Total-Hb minus Met-Hb," Met-Hb, bilirubin, biliverdin, methylene blue, and a combination thereof.

21. A spectroscopic apparatus comprising:

a) a source of electromagnetic radiation (EMR) for producing a light path;

b) an aperture located within the light path between the source of EMR and a sample slot;

c) the sample slot for receiving a sample vessel, and placed within the light path;

d) one or more than one photodetectors located on a same side of the sample slot as the source of EMR, the one or more than one photodetector in operative association with the spectroscopic apparatus;

e) one or more than one primary calibration algorithm in operative association with the spectroscopic apparatus, the one or more than one primary calibration algorithm developed using one or more than one other apparatus, or one or more than one upgraded primary calibration algorithm algorithm in operative association with the spectroscopic apparatus.

22. The apparatus according to claim 21, wherein the sample vessel is selected from the group consisting of, a cuvette, a sample tab, a pipette tip, tubing, a labelled test tube, an unlabeled test tube, blood bag tubing, a transparent sample container, a translucent sample container, and a flow-through cuvette.

23. The apparatus according to claim 22, wherein the sample tab contains the sample placed between a cover plate and a base plate, wherein at least a portion of the cover plate is reflective, transparent or translucent and at least a portion of the base plate is reflective, transparent or translucent, and wherein the cover plate is hingedly attached to the base plate.

24. The apparatus according to claim 21, wherein the source of EMR is selected from the group consisting of a tungsten lamp, one or more than one Light Emitting Diode (LED), and one or more than one laser.

25. The apparatus according to claim 21, wherein the one or more than one photodetector is selected from the group consisting of Photodiode or Charged Coupled Detector (CCD).

26. The apparatus according to claim 21, wherein the one or more than one photodetector is comprised of an array of detectors, housed inside a spectrometer within the spectroscopic apparatus, the spectrometer further comprising a diffraction grating.

27. The apparatus according to claim 21, wherein the one or more than one calibration algorithm was developed using an order derivative of absorbance of calibration samples, at one or more than one wavelength of a standard set of wavelengths, and a statistical technique selected from the group consisting of simple linear regression, multiple linear regression, and multivariate analysis.

28. The apparatus according to claim 27, wherein the multivariate analysis is selected from the group consisting of partial least squares, principal component analysis, neural network, and genetic algorithm.

29. The apparatus according to claim 21, wherein the sample is selected from the group consisting of whole blood, serum, plasma, urine, synovial fluid, lymphatic fluid, sputum, feces, cerebrospinal fluid and a non-biological sample.

30. The apparatus according to claim 21, wherein the one or more than one primary calibration algorithm is for an analyte selected from the group consisting of a Hb-based blood substitute, Total-Hb, Oxy-Hb, "Total-Hb minus Met-Hb," Met-Hb, bilirubin, biliverdin, methylene blue, and a combination thereof.